

HEALTHY COASTAL ECOSYSTEMS FOCUS TEAM

PROTECTED AREAS IMPACTS

OCTOBER 2009

20 CALIFORNIA: Baseline Studies of Marine Protected Areas

California Sea Grant researchers identified the population structure of cabezon (one of the most economically important fisheries in Central California); they also mapped the movements and home ranges of spiny lobsters and of two key sport fishes, and examined the effects of climate change on fish assemblages. Another group of studies collectively provided a snapshot of key species in rocky intertidal, mid-depth and deep waters off Central California, providing a baseline for detecting changes in fish sizes and abundances within and outside of no-take zones. A socio-economic study of the effects of the Central Coast MPAs was also conducted. California Department of Fish and Game is using the research to monitor the newly created Central Coast Marine Protected Areas and to help plan future MPA networks. These results should be of great benefit to state resource managers and in designing future reserves. Based on the research, resource managers should be able to predict site fidelity and home range sizes based on benthic habitat maps for the key species studied. This may allow managers to design reserves that facilitate fisheries by allowing for more catch along reserve boundaries or restricting fishing access by placing boundaries at distances greater than 100m from the rock/sand boundary. This information directly fits in the NOAA Ecosystem Research Program performance measure III (tools) by providing a means for managers to use benthic habitat maps to predict MPA size, shape, and habitat composition for the four species studied. This information will also be of interest to fishers who will now have more concrete evidence that MPAs with particular habitat types may provide good protection for certain species and that managers will now have better tools to tailor MPA design to meet particular management objectives. [*fish ebm cli prot*]]

1198 CALIFORNIA: Sea Palm Harvest Data Assists California Agency

Researchers provided Calif. Dept of Fish & Game with personal knowledge of commercial seaweed collecting sites to supplement CDFG logbook data. The information helped CDFG evaluate protests by commercial harvesters that they were overlooked stakeholders with respect to the proposed placement of North Central Coast marine protected areas. [*R/CZ-200 (prot)*]]

938 CONNECTICUT: NOAA and NOAA Sea Grant standard for evaluating effectiveness of MPAs leads to international job creation

The guide, *How is Your MPA Doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness*, written by NOAA and Connecticut Sea Grant experts in 2004, has been used by hundreds of MPAs around the world to establish management effectiveness evaluation programs. An estimated 200 new positions worldwide have been created to lead MPA management effectiveness evaluations, and an additional 600 temporary positions established for consultants and staff to undertake MPA management effectiveness evaluations. [*A/E-1 (prot)*]]

1281 GEORGIA: Sea Grant Researchers' Protocol Helps Assess Health of Marine Sanctuary

Sea Grant researcher Dr. Daniel Gleason has developed a protocol for determining how and how well hard bottom reefs will recover from disturbances. His protocol and data are being employed by the Gray's Reef National Marine Sanctuary Theme: Health Coastal Ecosystems [*R/HAB-27 (prot)*]]

24 HAWAII: Sea Grant supports a volunteer coral reef monitoring program

In its ninth year of existence, the ReefWatcher monitoring program established by Hawaii Sea Grant trains volunteers to count fish and invertebrates in selected reef locations around the island of Hawaii. The goal of this program is to collect baseline data from selected monitoring sites continuously over the years. Impact: Since 2006, over 185 citizens have participated in ReefWatcher training. Data from this volunteer corp has been gathered for 16 sites, some for as long as seven years or more. Six years of ReefWatcher data has been converted from Microsoft Excel to Access database format by Hawaii Sea Grant to compliment the data management format used by the State Division of Aquatic Resources (DAR). Data collected by ReefWatcher volunteers over time has reflected trends similar to those documented by DAR scientists and, in addition, provide new data from nearshore areas not normally surveyed by the state, including intertidal and snorkel depth areas. [*(mon prot train)*]

1337 MAINE: State fishery regulators use report to define conservation area

All results of this study and a formal report have been provided to the Maine Department of Marine Resources (DMR), which regulates the bait worm industry. The DMR has asked the State Legislature to more formally define the Wiscasset Conservation Area where long-term data on bloodworm abundances have been collected by Ambrose and Ted Creaser since the late 1960s. [*R/06-01 (prot)*]

555 MISSISSIPPI/ALABAMA: Legal research results in formation of new marine reserve/protected area

Through the 2007 Grant Competition, the Law Center funded an investigation into whether Port Orford, Oregon could develop a community-based fishery management system. The Project Team recommended four options the community could pursue, including nominating two areas off Port Orford for inclusion in Oregon's proposed Marine Reserve network. On September 28, 2008, the project team submitted a local proposal for a marine reserve/marine protected area, the Redfish Rocks Research Reserve, under Oregon's statewide marine reserve planning process. The Oregon Ocean Policy Advisory Council recommended that Redfish Rocks move forward as a pilot marine reserve. Governor Theodore Kulongoski's 2009-2011 recommended budget includes funds to support initial implementation of Redfish Rocks. [*A/L-4 (leg prot)*]

9 NORTH CAROLINA: Sea Grant results aid sparrow protection

New knowledge on habitat use by Nelson's and Saltmarsh Sharp-tailed Sparrows in North Carolina will help the National Audubon Society in efforts to identify key areas and habitats for protection. (NCSG: Ecology of Nelson's and Saltmarsh Sharp-tailed Sparrows in Southeastern North Carolina; R/MG-0624) [*MD/A-2 (ebm prot)*]

1150 CALIFORNIA: Ecosystem-Based Management

Findings from the project were used in the California Marine Life Protection Act (MLPA) Initiative process for developing potential marine reserve designs in the Gulf of the Farallones-Cordell Bank region. The researchers formulated conservation and management recommendations to protect the marine food webs in this region. They provided distribution and abundance maps of marine birds and mammals (to show areas of high importance); they developed statistical models to understand these observed distributions and abundances in relation to krill abundance, oceanographic conditions and local physiography; and they proposed design considerations for marine protected areas in the Gulf of the Farallones-Cordell Bank region. *[R/CZ-202 (prot mon mod ebm)]*

1178 CALIFORNIA: Modeling Coastal Processes

We have identified several general categories of users who will benefit from the results of this research: The modeling capability can be used in a predictive mode by local, state, and federal environmental regulators currently setting standards for non-point storm water runoff and Total Maximum Daily Loads for inland streams that discharge to the ocean and for atmospheric emissions. The research will also benefit the operators of municipal and industrial facilities that discharge into impacted embayments who need to understand the impacts of their respective discharges. The research will assist EPA and other regulatory agencies in evaluation of alternative schemes for remediation of contaminated coastal sediments, such as the DDT patch near Santa Monica Bay, currently the focus of a federal Superfund effort. The research will be useful to marine scientists trying to understand how the physical and biogeochemical processes in enclosed embayments interact with the natural aquatic ecosystem. The research will be useful to marine scientists trying to understand where to site marine protected areas. The research will assist scientists in understanding the causes and characteristics of harmful algal blooms in the coastal region. *[R/CZ-193 (prot wq mod res mon)]*

135 MAINE: Partners clean up Ogunquit beaches

High bacteria levels on Ogunquit Beach prompted the Maine Healthy Beaches Program to conduct a multi-year special study of the Ogunquit River and Ogunquit Beach watershed. In 2008, program staff (in partnership with the Maine Geological Survey) presented the study findings and recommendations based on a coastal current survey, additional monitoring, and GIS HOT-SPOT analysis to state and town representatives and local residents. As a result, the town of Ogunquit inspected 53 subsurface disposal systems, initiated a stormwater mapping project, and the Ogunquit Conservation Commission passed a new ordinance titled: An Ordinance to Amend the Ogunquit Zoning Ordinance (Title X) to Protect Additional Streams Beyond Those Required by Department of Environmental Protection Minimum Shoreland Zoning Guidelines. Additionally, the towns of Wells and Ogunquit committed \$8,000 to support implementation of the Ogunquit River Management Plan (in partnership with the Wells National Estuarine Research Reserve). *[A/08-01 (wq wq wq ebm prot)]*

150 MICHIGAN: Sea Grant Provides Planning Support for Michigan's Northeast Region

More than 50 partner organizations, state agencies, and three county governments collaborated on a two-year Sea Grant-led project to stimulate economic development and sustainability in Michigan's northeast region. In 2007, project research teams finalized five technical assessments characterizing the status of life in northeast Michigan, focusing on socioeconomic, ecological, cultural, planning and zoning, and sustainable design. The Northeast Michigan Integrated Assessment (NEMIA) has resulted in unprecedented regional collaboration. Notable outcomes include: 1) cooperation between the NOAA Thunder Bay National Marine Sanctuary and Michigan Department of Natural Resources to incorporate cultural interpretation into MDNR sites; 2) development of a regionally coordinated management plan for three coastal state parks with citizen input; 3) the collaborative capacity to apply for a People and Land (PAL) grant supported by the W K Kellogg Foundation; 4) selection of northeast Michigan by Michigan State University Extension as a pilot community for regional economic development; 5) successful state funding to enhance recreational opportunities for paddlers along northern Lake Huron; and 6) selection of the northeast region to receive funding from the Great Lakes Fishery Trust to support Great Lakes place-based education. In all, a total of \$195,000 was secured as a result of the NEMIA process, with \$70,000 pending. [(soc train prot res)]

154 OREGON: Oregon Sea Grant Played a Critical Role in the Creation of Marine Reserves In Oregon

Governor Kulongoski's directive to the state Ocean Policy Advisory Council (OPAC) in 2006 for recommendations on marine reserves set in motion a concerted effort that, by late 2007, had reached an impasse. Oregon Sea Grant (OSG) was invited by OPAC to design, develop, and implement extensive "listening and learning" in coastal communities. After a series of coastal meetings with stakeholders, all the comments were shared publicly in late spring 2008 at <http://seagrant.oregonstate.edu/outreach/reserves.html#report>. OSG's report to the governor caused a major change in the process of developing marine reserves. That new process sought to marry scientific and experiential knowledge with a community-driven approach. The result of this process was the OPAC's identification of two pilot marine reserves and four other areas for further consideration. The 2009 Oregon Legislature approved this plan (HB 3013) and dedicated funding of \$1 million to it. The Oregon Department of Fish and Wildlife's chief of fisheries and the governor's representative on OPAC both commended OSG's pivotal role in the successful development of the state's first marine reserves within Oregon's Territorial Sea. [(train prot)]

155 PUERTO RICO: Community participation in the stewardship of marine ecosystems through Marine Protected Areas

Sea Grant research thrust in the 1990's underscored the importance of MPA as a key tool for the effective management of the local fisheries. Our extension efforts also promoted the public participation in co-management and other arrangements, to increase the capabilities of the conservation agencies to protect critical habitats. In the late 1990's and in the 2000's the program supported the effort of communities, NGOs and government agencies in the designation of marine reserves in the island-municipality of Culebra (East Coast), and the Tres Palmas in Rincón (West Coast). Over the last 5 years, Sea Grant supported the development of management plans for both reserves, in a participatory manner that developed the mechanisms for the participation of the community in the

stewardship of marine ecosystems. Sea Grant is a partner, with other stakeholders, in the collaborative effort to protect the reserves. These plans and processes are unique for Puerto Rico, and Sea Grant leadership (jointly with CIEL in the last two years) made it possible, and its efforts have been duly recognized in the media. Partners in this effort are: the DNER, Surfrider Foundation, Fishermen Associations of Culebra and Rincón, researchers from UPR, Interdisciplinary Center for Coastal Studies (CIEL), the Rincón and Culebra Tourism and Ecotourism Associations, and the municipal governments. [*prot*]

1588 WASHINGTON: Sea Grant Develops New Ecosystem Model to Manage California Current Fisheries

Many West Coast fisheries, their resources, and the port communities they support have collapsed in recent decades. Sea Grant research has developed a bioeconomic model for the California Current ecosystem – one that quantifies resilience and tradeoffs among marine ecology, regional economics, and climate interactions within the ecosystem. Impact: The Pacific Fishery Management Council (PFMC) is using the model in its management process to address development of marine protected areas, fleet capacity reductions, rebuilding of overfished groundfish and salmon stocks, and the relationship between sustainable fishing communities and the coastal marine ecosystem. The model allows managers to better account for dynamic linkages among the ecosystem, socio-economics, and management of the fishery, as well as ecological complexity and spatial variability. [*R/F-145 (prot ebm cli mod)*]

224 CONNECTICUT: Sea Grant dune restoration reflects ecological and economic importance

Connecticut Sea Grant worked with a local land trust and several private companies to restore 750 ft of an active dune system bordering Long Island Sound in 2007-2008. The dune provides partial protection for the recently-restored 10-acre Lynde Point tidal marsh in the lower Connecticut River tidelands that have been designated Wetlands of International Significance, and is part of 4+ acres donated by the late Katharine Hepburn to the land trust for open space protection. Abutting the former Hepburn home (which sold for \$6M, the highest ever for a property in this town), the value of this less than 1-acre dune and beach is reflected by its assessment at ~\$69,400 (2.3 times the per-acre assessment for wetlands and ~3 times that of a typical per-acre assessment for unbuildable lots); adjacent coastal buildable lots are valued at \$3M per acre. *[A/E-1 (res prot)]*

260 HAWAII: Hawaii Sea Grant Supports Dune Restoration Efforts on Maui

Coastal dunes at Kamaole III Park in Kihei, Maui, have long suffered from degradation due to grading, foot traffic, and lack of vegetative ground cover. Zoe Norcross-Nu'u, a Hawaii Sea Grant Coastal Processes Extension Agent based in Maui, worked with the Maui Parks Department and a community non-profit volunteer group, Hoaloha Aina, to design, obtain funding for and implement a dune restoration project at the park. The project, which was begun in 2005, is experiencing great success. The second phase of the project is now underway and will involve dune enhancement with sand dredged from the Kihei Boat Ramp beginning September 17, 2007. Sand placement will be followed by planting with native coastal plants, sand fencing for temporary dune protection and post-and-rail fencing for long-term dune protections, as well as wooden beach access stairways to prevent erosion at high-use areas. Impact: The project has been educational to the Kihei community for residents and visitors alike. The project was the recipient of the National Association of County Parks and Recreation Officials Award in the Environmental/Conservation category, awarded on July 16, 2007 in Richmond, Virginia. This award was recognized by the Maui County Council on August 21, 2007, with the adoption of Resolution No. 07-98, "Congratulating the Kamaole III Beach Park Sand Dune Restoration Project for Winning the 2007 National Association of County Parks and Recreation Officials Award in the Environmental/Conservation Category," in which Norcross was recognized as a contributor. *[(ebm res prot)]*

945 NORTH CAROLINA: Placement of New Oyster Reefs in Pamlico Sound, NC

A key issue regarding the application of networks of reserves for fisheries and ecosystem-based management is justification for where to locate reserves and at what sizes. North Carolina Sea Grant research has provided scientific justification for determining the location of oyster broodstock reserves in Pamlico Sound, NC, as well as the size of reserves necessary to ensure that the network persists over time. Additionally, this research has demonstrated that oyster densities in reserves have increased 432% in three years, with an average of about 1500 oysters/m², and that growth and survival rates of oysters are high relative to other studies in US estuaries. The results from this study provide solid evidence of the positive response of the oyster population in Pamlico Sound to restoration efforts using mounds of rip-rap placed in no-take broodstock reserves. *[R/MRD-56 (ebm prot fish res)]*

